

## NOTES

**Nesting Association of the Cyprinid Fishes *Phoxinus cumberlandensis* and *Semotilus atromaculatus* (Cyprinidae).**—*Phoxinus cumberlandensis*, a cyprinid endemic to small, upland streams in the upper Cumberland River basin of eastern Kentucky and Tennessee (1), is known to spawn only over fine, silt-free gravel in *Campostoma anomalum* nests (2). In silt-free streams, *P. cumberlandensis* presumably spawns over gravel in riffles or runs. However, siltation and habitat loss from coal mining, silviculture, agriculture, and road construction have reduced and fragmented *P. cumberlandensis* habitat and resulted in the fish being a threatened species by the U.S. Fish and Wildlife Service (3). Herein we report observations of an additional host species for *P. cumberlandensis*.

On 12 May 1993 we observed and photographed ca. 30 brilliantly colored *P. cumberlandensis* in an occupied *Semotilus atromaculatus* nest in Rock Creek, McCreary County, Kentucky. Rock Creek is a second-order tributary to Jellico Creek; it supports one of the best remaining populations of *P. cumberlandensis* in Kentucky (Cicerello and Laudermilk, unpubl. data). Upstream from the site of our observations, the watershed is densely forested and contains only one small, reclaimed strip mine along the Tennessee border. As a result, the sand, gravel, and scattered cobbles underlying the stream's alternating pools and short riffles are relatively silt-free. At the time of our observations, Rock Creek was clear, low, and ca. 3–4 m wide; flow was slow to negligible. The gravel *Semotilus* nest was at a depth of ca. 7–10 cm in the lower end of a pool immediately upstream from a small riffle.

When we approached the stream, the nest's occupants fled to the deeper, upper end of the pool, but the *P. cumberlandensis* aggregation slowly meandered back toward the nest after we took cover. Members of the aggregation included brilliantly colored males and females and smaller, apparently juvenile individuals lacking bright spawning colors. While moving toward the nest, males chased females individually and in groups in the manner described by Starnes and Starnes (2). After an estimated 10–15 minutes, the aggregation returned to and hovered over the ca. 25 cm diameter nest depression. About 5–10 minutes later, a nuptial male *Semotilus* (ca. 18 cm TL) returned to the nest where his presence was obscured by the *P. cumberlandensis* hovering above. Starnes and Starnes (2) witnessed aggressive behavior toward *Semotilus* by nesting *C. anomalum*, which they believed provided associated *P. cumberlandensis* with some protection from egg predation. We did not observe spawning by *P. cumberlandensis*, but their behavior and previously unreported association with a nesting *S. atromaculatus* (4) are consistent with spawning by *P. cumberlandensis* observed in a *C. anomalum* nest (2) and by *P. oreas* in *Nocomis* nests (5).

*Phoxinus cumberlandensis* occurs syntopically with *Semotilus* and *C. anomalum* above Cumberland Falls, and with *Semotilus* and *C. oligolepis*, a probable *P. cumberlandensis* nesting host, below the falls. However, *Semotilus*

occurs more frequently and is more abundant than *Campostoma* spp. in streams inhabited by *P. cumberlandensis*. Of 95 collections of *P. cumberlandensis* made in 1993–1994, 89 (94%) included *Semotilus* but only 24 (25%) included *Campostoma* spp. During April through June, when *P. cumberlandensis* spawns (2), *Semotilus* also was present more often than *Campostoma* spp. (51 collections vs. 11).

We believe these observations strongly suggest that *P. cumberlandensis* spawns in *Semotilus atromaculatus* nests, even in relatively silt-free streams such as Rock Creek; that *Semotilus* is more important than *Campostoma* spp. in providing spawning habitat for *P. cumberlandensis*; and that nest-building cyprinids probably play an important role in conservation of *P. cumberlandensis* by providing spawning habitat in relatively clean streams as well as those degraded by silt. However, additional observations are needed to confirm these findings and to document spawning by *P. cumberlandensis* independently of nest-building cyprinids.

We thank B.M. Burr (Southern Illinois University at Carbondale) for reviewing the draft, and V. Bishop and L. Perry (U.S. Forest Service) for providing land-use information. This study was supported in part by the Kentucky Department for Surface Mining Reclamation and Enforcement, Frankfort, Kentucky.

**LITERATURE CITED.** (1) Starnes, W. C., and L. B. Starnes. 1978. A new cyprinid of the genus *Phoxinus* endemic to the upper Cumberland River drainage. *Copeia* 1978:508–516. (2) Starnes, L. B., and W. C. Starnes. 1981. Biology of the blackside dace *Phoxinus cumberlandensis*. *Am. Midl. Nat.* 106(2):360–371. (3) U.S. Fish and Wildlife Service. 1987. Endangered and threatened wildlife and plants; determination of threatened species status for the blackside dace. *Fed. Reg.* 52:22580–22585. (4) Johnston, C. E., and L. M. Page. 1992. The evolution of complex reproductive strategies in North American minnows (Cyprinidae). Pages 600–621 in R. L. Mayden (ed). *Systematics, historical ecology, and North American freshwater fishes*. Stanford Univ. Press, Stanford, CA. (5) Raney, E. C. 1947. *Nocomis* nests used by other breeding cyprinid fishes in Virginia. *Zoologica* 32:125–132.—**Ronald R. Cicerello and Ellis L. Laudermilk**, Kentucky State Nature Preserves Commission, 801 Schenkel Lane, Frankfort, KY 40601.

***Sclerochloa dura* (Poaceae) in Kentucky.**—The European grass *Sclerochloa dura* (L.) Beauv. (Figure 1), hard grass, was first collected in North America in New York in 1895, but this introduction apparently did not lead to naturalization of the species. Thirty-three years later, in 1928 in Utah, the grass was collected again. Since then,





Cicerello, Ronald R. and Laudermilk, Ellis L. 1996. "Nesting association of the cyprinid fishes *Phoxinus cumberlandensis* and *Semotilus atromaculatus* (Cyprinidae)." *Transactions of the Kentucky Academy of Science* 57(1), 47-47.

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